Wave Variability in the North Pacific Associated with ENSO

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This study aims to investigate the observational wave variability in the North Pacific modulated by ENSO. The International Comprehensive Oceanic Atmospheric Datasets (ICOADS-version 2.5) compiled from the ship and buoy observations are used to depict the oceanic conditions. Wave height and wind speed of this data are analyzed. The ERSST version 3 and NCEP/NCAR reanalysis data are employed to depict the large-scale oceanic and atmospheric variability. Since ENSO reaches its maximum intensity during winter, the analysis period includes winters from 1982/83 to 2007/08.

Major findings of this study are summarized as follows:

- For the strong ENSO cases (Nino 3.4 SST anomaly larger than 1^0C), El Nino induces an anomalous anticyclone over the Philippine Sea and a giant anomalous cyclone over the northeastern Pacific. The former weakens the intensity of the seasonal northeastern monsoon flows, leading to weakened wind speed and wave height over the SCS, Taiwan Strait, and the Philippine Sea. The latter intensifies the mid-latitude westerlies with increased wind speed and wave height over the southeastern boundary of the Aleutian low. Opposite conditions occur for the strong La Nina case.
- The anomalies of wind speed depicted by the IMMA data exhibit a coherent large-scale pattern with that of the NCEP reanalysis data, indicating the competence of the ICOADS data in depicting the climate variability phenomenon.
- For the weak ENSO cases (Nino 3.4 SST anomaly between 0.5^0 and 1^0C), the ENSO-induced circulation anomalies vary evidently from year to year, and thus no persistent variation of wind speed and wave height occurs in the SCS nor in the mid-latitude North Pacific.

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